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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MANFRED GILBERT

Appeal 2007-4010
Application 10/694,690
Technology Center 2800

Decided: April 30, 2008

Before KENNETH W. HAIRSTON, CARLA M. KRIVAK,
and KARL D. EASTHOM, *Administrative Patent Judges*.

HAIRSTON, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

INVENTION

Appellant's claimed invention is to a comparison optical system (Figure 1) comprising several image-acquiring optical subsystems (2a, 2b) and a bridge (3) mechanically and optically connecting the optical subsystems to one another (Spec. 5: ¶33). Each of the image-acquiring optical subsystems possesses an XYZ stage (8a, 8b), movable in a motorized fashion, wherein a specimen to be compared is placed on each of the stages (Spec. 5: ¶33). A control unit (14) moves the XYZ stages (8a, 8b), in a motorized fashion, synchronously in all three spatial directions (Spec. 5: ¶39).

Claim 1 reproduced below is representative of the subject matter on appeal:

1. A comparison optical system comprising:
several image-acquiring optical subsystems, each image-acquiring system associated with its respective motorized XYZ stage;
a bridge coupling the several image-acquiring optical subsystems mechanically and optically to one another; and
a control unit for synchronously moving all motorized XYZ stages in in [sic] all three spatial directions.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Uchiyama	US 4,123,170	Oct. 31, 1978
Reichel	US 4,403,839	Sep. 13, 1983
Garner	US 5,557,456	Sep. 17, 1996

The following rejections are before us for review:

1. Claims 1, 3-5, and 13-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama in view of Garner.
2. Claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama in view of Garner as applied to claim 1 above, and further in view of Reichel.
3. Claims 6-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama in view of Garner and Reichel.

OBVIOUSNESS

There are multiple obviousness issues before us regarding whether Appellant has shown that the Examiner erred in rejecting claims 1-20 under 35 U.S.C. § 103(a). Claims 1, 3-5, and 13-20 were argued as a group with claim 1 as representative (Br. 2-7).¹ Further, Appellant has presented no further arguments as to the additional reference of Reichel used in rejecting claims 2 and 6-12, but

¹ Only arguments made by Appellant have been considered in this decision. Arguments, which Appellant could have made but did not make in the Brief, have not been considered and are deemed waived. See 37 C.F.R. § 41.37(c)(1)(vii) (2004).

instead relies on the arguments provided for claim 1 (Br. 7-8). Accordingly, claims 2 and 6-12 will likewise stand or fall with claim 1. Appellant presents additional arguments with respect to claims 9-10 and 15-16 (Br. 8).

We present these issues as they correspond to, and in the order of, Appellant's presented arguments.

A. The first issue, regarding claims 1-20, is whether Uchiyama teaches "several image acquiring optical subsystems, each subsystem being associated with its respective motorized XYZ stage."

B. The second issue, regarding claims 1-20, is whether Uchiyama in view of Garner teaches "synchronously moving all motorized XYZ stages in all three spatial directions."

C. The third issue, regarding claims 9 and 15, is whether Uchiyama in view of Garner teaches one X actuation element to displace synchronously both the first and second stages in the X direction, one Y actuation element to displace synchronously both the first and second stages in the Y direction, and one Z actuation element to displace synchronously both the first and second stages in the Z direction.

D. The fourth issue, regarding claims 10 and 16, is whether Uchiyama in view of Garner teaches an on/off switch for the synchronous displacement of the two motorized XYZ stages.

FINDINGS OF FACT

The relevant facts include the following:

1. Appellant's claim 1 does not require "separate" or "distinct" motorized XYZ stages.
2. Figure 5 of Uchiyama shows table 22 that constitutes an XYZ stage having masks 20 and 21 thereon, wherein each of the masks is associated with an image acquiring subsystem. Figure 5 of Uchiyama shows that elements 26 and 27 constitute the imaging subsystem associated with mask 21 and that elements 29 and 30 constitute another imaging subsystem associated with mask 20 (Figure 5).
3. Uchiyama teaches that masks 20 and 21 are moved in the orthogonal X and Y directions by the movement of the same table carrier 22 (col. 4, ll. 50-54). Thus, necessarily both masks 20 and 21 will move synchronously by the movement of the table carrier 22.
4. Uchiyama further teaches that alignment of the two masks 20 and 21 is important for accurate scanning and comparison of the mask to be tested 20 with the sample mask 21 to accurately detect any defects (col. 4, ll. 54-59).
5. Uchiyama discloses a stage position detection device which supplies a signal representing coordinates of stage 22 (col. 8, ll. 50-51).
6. Uchiyama teaches a stage driver 66 as shown in Figure 14 which constitutes motorized movement based on the control of circuit 40 (Figure 14).
7. Although Uchiyama's Figure 14 addresses the embodiment of Figure 6 rather than the embodiment of Figure 5, the embodiments do not differ with respect to the mechanism of movement of table 22 since Figure 6 further improves the detection mechanism of defects by placing the compared samples (i.e., 20A and 20B) closer together and using different detection

optics so that the movement of the table 22 does not introduce as many errors (col. 4, l. 60-col. 5, l. 10).

8. Garner teaches that motorized movement in the Z direction is used for focusing (col. 4, ll. 6-9).
9. Garner teaches a motorized controller 10 to control the movement of motorized stage 3 in all three spatial directions XYZ driven by X axis motor 4, Y axis motor 5, and Z axis motor 6 (col. 3, ll. 39-58).
10. Garner characterizes as “typical” the use of a stage controller for the 3-axis motorized stage (col. 1, ll. 15-20).
11. Garner teaches a fine control switch (i.e., switch 40) used to toggle between a number of pre-selected stage movement speed ranges in the X and Y direction (col. 4, ll. 21-29), and, thus, vary the entries at the X and Y control knobs (14, 16, 18).

PRINCIPLES OF LAW

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383

U.S. 1, 17-18 (1966). *See also KSR*, 127 S. Ct. at 1734 (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”)

The Examiner’s articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The Supreme Court, citing *In re Kahn*, 441 F.3d at 988, stated that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. at 1741. However, “the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *Id.*

One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). The test of obviousness is what the combined teachings would have suggested to those of ordinary skill in the art. *Id.* at 425.

Although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

ANALYSIS

We address Appellant’s arguments in the order they were presented.

A. Does Uchiyama teach several image acquiring subsystems, each subsystem being associated with its associated XYZ stage?

Appellant argues that Uchiyama “does not disclose ‘several image acquiring optical subsystems, each subsystem being associated with its respective motorized XYZ stage,’ as claimed in independent Claim 1” (Br. 5). Appellant argues that the “two XY stages - are actually two masks - a sample mask 21 and a tested mask 20, which are samples, specimens and not motorized stages. Uchiyama explicitly discloses that both masks 20 and 21 are placed on a single carrier table 22. That same one single carrier table 22 moves in the X-Y directions, so the two masks that are placed on that same table move together with the table” (Br. 5). Appellant concludes that “[s]ince no respective XYZ stages, each of which is associated with their own respective image-acquiring optical subsystem, is disclosed in Uchiyama, the first requirement of the non-obviousness test has not been met.” (Br. 5).

The Examiner agrees that elements 20 and 21 of Uchiyama are sample masks, but they are also indicators of the respective portions of the stage (22) with which each of the image-acquiring systems is associated (Ans. 9). The Examiner states that the claim language does not require “separate” or “distinct” motorized XYZ stages, only that each image acquiring system be associated with its respective motorized XYZ stage (Ans. 9). The Examiner states that the claim language allows for the respective XYZ stage to be a single stage that is large enough to be imaged by each of the image acquiring systems, and, as shown in Figure 4 of Uchiyama, the stage 22 spans the entire distance between the two

image acquiring systems to allow both systems to be associated with the stage 22 at locations 20 and 21 (Ans. 9).

We agree with the Examiner's findings of fact and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

At the outset, we note that the disputed limitation of claim 1 requires: "several image acquiring subsystems, each subsystem being associated with its associated XYZ stage." Thus, Appellant's claim 1 does not require "separate" or "distinct" motorized XYZ stages (Finding of Fact 1), and, therefore, a single XYZ stage having two locations (i.e., Figure 5 of Uchiyama with XYZ stage 22 having separate locations for masks 20 and 21) wherein each of those locations is associated with an image acquiring subsystem (i.e., in Figure 5 of Uchiyama elements 26 and 27 that form the imaging subsystem associated with mask 21 as well as elements 29 and 30 that form another imaging subsystem associated with location 20) reads on the disputed claim limitation (Finding of Fact 2). As stated *supra*, although claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d at 1184.

Thus, we are not persuaded by Appellant's argument regarding claims 1-20 because Uchiyama teaches several image acquiring subsystems, each subsystem being associated with its associated XYZ stage.

B. Does Uchiyama in view of Garner teach "synchronously moving all motorized XYZ stages in all three spatial directions?"

Appellant disagrees with the Examiner's identification of col. 4, ll. 50-53, which states: "the mask 20 and the sample mask 21 are placed on the same carrier table 22 and are moved in the orthogonal X and Y directions," as a teaching of a control unit for moving the XY stage in a motorized fashion (Br. 5-6). Appellant argues the following:

There is absolutely nothing in these lines, as well as anywhere else in Uchiyama, disclosing a control unit for synchronously moving all motorized XYZ stages in all three spatial directions. The mention in Uchiyama that the sample carrier table 22 could move in the orthogonal X and Y directions provides no disclosure of a control unit possibly accomplishing such movement. Moreover, there is no disclosure at all in the whole Uchiyama patent of what makes the sample carrier table of Uchiyama move. Col. 8, lines 50-51 of Uchiyama say that there is stage position detection device, which supplies a signal representing coordinates of stage 22. This has nothing to do with a control unit synchronously moving at least two motorized XYZ stages. Logically, the word "synchronously" couldn't even be found anywhere in the Uchiyama patent (by running the Edit-Find function on the HTML text of the Uchiyama patent).

The disclosure of Garner does not provide the missing disclosure of Uchiyama. . . . Nowhere in Garner could there be found a disclosure of 'several image acquiring optical subsystems, each subsystem being associated with its respective motorized XYZ stage', as claimed in independent Claim 1. Similarly, no disclosure of a control unit for synchronously moving all motorized XYZ stages in all three spatial directions could be found in Garner.

Therefore, neither Uchiyama nor Garner alone, nor in combination with each other, disclose each and every element of the invention as claimed in independent Claim 1.

Br. 6.

While the Examiner agrees that the word “synchronously” is not present in the Uchiyama reference, the Examiner clarifies that the word synchronously does not have to be present for the reference to provide a teaching of synchronous movement by the respective stage (Ans. 9). The Examiner explains that as the stage 22 moves, the locations of masks 20 and 21 will move with the stage along the same direction and at the same rate of movement, due to the fact that the masks are directly on the stage (Ans. 9). The Examiner further states that stage 22 is formed of solid material as shown in Uchiyama’s Figure 4, and therefore, the movement of any piece of the stage will cause the rest of the stage to move synchronously and carry along with it the locations shown by 20 and 21 (Ans. 9).

We agree with the Examiner’s findings of fact and conclusions as set out in the Answer and adopt them as our own. We add the following primarily for emphasis.

Uchiyama teaches that masks 20 and 21 are moved in the orthogonal X and Y directions by the movement of the same table carrier 22 (Finding of Fact 3). Thus, necessarily both masks 20 and 21 will move synchronously by the movement of the table carrier 22. Uchiyama further teaches that alignment of the two masks 20 and 21 is important for accurate scanning and comparison of the mask to be tested 20 with the sample 21 to accurately detect any defects (Finding

of Fact 4). Thus, it would have been obvious to one skilled in the art that synchronous movement of the masks 20 and 21 is required to accurately scan and compare the two samples.

While we agree with Appellant's argument that the stage position detection device as described in col. 8, ll. 50-51, which supplies a signal representing coordinates of stage 22 (Finding of Fact 5), does not synchronously move at least two motorized XYZ stages, we note that Uchiyama teaches a stage driver 66 as shown in Figure 14 which constitutes motorized movement based on the control of circuit 40 (Finding of Fact 6). We further note that while Figure 14 addresses the embodiment of Figure 6 rather than the embodiment of Figure 5, the embodiments do not differ with respect to the mechanism of movement of table 22 since Figure 6 further improves the detection mechanism of defects by placing the compared samples (i.e., 20A and 20B) closer together and using different detection optics so that the movement of the table 22 does not introduce as many errors (Finding of Fact 7). Thus, the movement of the table 22 is the same in both embodiments. Therefore, Uchiyama teaches synchronous movement of the two XY stages (i.e., masks 20 and 21 which necessarily have stage locations) by a control unit (i.e., 40) moving the two motorized stages (i.e., via motor or stage driver 66) in two orthogonal directions X and Y (Figure 14).

Furthermore, Garner teaches that motorized movement in the Z direction is used for focusing (Finding of Fact 8). The Examiner articulated for a motivation to combine the references that the motorized movement in the Z direction as taught by Garner in combination with the motorized movement in the X and Y directions as taught by Uchiyama would allow for focusing of the light on the stages (Ans. 7).

Thus, as stated *supra*, the Examiner's articulated reasoning in the rejection possesses a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d at 988.

However, even if we assume, without deciding, that Uchiyama does not teach motorized movement in the X and Y directions, Garner teaches a motorized controller 10 to control the movement of motorized stage 3 in all three spatial directions XYZ driven by X axis motor 4, Y axis motor 5, and Z axis motor 6 (Finding of Fact 9). Furthermore, Garner characterizes as "typical" the use of a stage controller for a 3-axis motorized stage (Finding of Fact 10). Thus, the combination of Uchiyama and Garner teaches a control unit for the motorized stage movement in all XYZ directions as claimed in claim 1, and the image acquiring subsystems (i.e., Figure 5 of Uchiyama, elements 29 and 30 as well as 26 and 27) associated with the respective motorized XYZ stage (i.e., Figure 5 of Uchiyama, elements 20 and 21) which move synchronously with the movement of the same table carrier 22.

We are also not persuaded by Appellant's argument that Garner does not teach several image acquiring optical subsystems, each subsystem being associated with its respective motorized XYZ stage as claimed in independent claim 1 (Br. 6). As stated *supra*, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d at 425. Thus, we are not persuaded by Appellant's arguments because Uchiyama teaches several image acquiring optical subsystems, each subsystem being associated with its respective motorized XYZ stage (Findings of Fact 1 and 2).

Thus, we are not persuaded by Appellant's argument regarding claims 1-20 that Uchiyama does not teach "synchronously moving all motorized XYZ stages in all three spatial directions" because the combination of Uchiyama and Garner teach this limitation.

C. Does the combination of Uchiyama and Garner teach one X actuation element to displace synchronously both the first and second stages in the X direction, one Y actuation element to displace synchronously both the first and second stages in the Y direction, and one Z actuation element to displace synchronously both the first and second stages in the Z direction?

Appellant argues that the combination of Uchiyama and Garner does not teach one X actuation element to displace synchronously both the first and second stages in the X direction, one Y actuation element to displace synchronously both the first and second stages in the Y direction, and one Z actuation element to displace synchronously both the first and second stages in the Z direction (Br. 8).

As stated previously, Uchiyama teaches that mask locations 20 and 21 (i.e., masks 20 and 21 necessarily have stage locations) are moved in the orthogonal X and Y directions by the movement of the same table carrier 22 (Finding of Fact 3), and thus, necessarily both mask locations 20 and 21 move synchronously (Finding of Fact 3). Garner teaches a motorized controller 10 to control the movement of motorized stage 3 in all three spatial directions XYZ driven by X axis motor 4, Y axis motor 5, and Z axis motor 6 (Finding of Fact 9). Garner teaches that motorized movement in the Z direction is used for focusing (Finding of Fact 8). The Examiner articulated for a motivation to combine the references that the motorized movement in the Z direction as taught by Garner in combination with

the motorized movement in the X and Y directions as taught by Uchiyama would allow for focusing of the light on the stages (Ans. 7). Thus, as stated *supra*, the Examiner's articulated reasoning in the rejection possesses a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d at 988.

Thus, the combination of Uchiyama and Garner teaches synchronous movement of two stages (i.e., elements 20 and 21 of Uchiyama) in the X and Y directions (via use of X axis motor 4 and Y axis motor 5 of Garner) and in the Z direction (via use of Z axis motor 6 of Garner). Movement of the table 22 having the two stages (i.e., 20 and 21) in the Z direction would necessarily synchronously move the two stages since they are on the same table 22.

Thus, we are not persuaded by Appellant's argument regarding claims 9 and 15, because the combination of Uchiyama and Garner teaches one X actuation element to displace synchronously both the first and second stages in the X direction, one Y actuation element to displace synchronously both the first and second stages in the Y direction, and one Z actuation element to displace synchronously both the first and second stages in the Z direction.

D. Does Uchiyama in view of Garner teach an on/off switch for the synchronous displacement of the two motorized XYZ stages?

Appellant argues that "nowhere in the combined disclosure of the cited patents is there a disclosure of one on/off switch synchronous displacement of the two motorized XYZ stages, as claimed in claims 10 and 16." (Br. 8).

Appellant's claims 10 and 16 state that "the control and adjustment apparatus encompasses an on/off switch for a synchronous displacement of the two

XYZ stages which acts in such a way that when the on/off switch for synchronous displacement is switched on, both XYZ stages are movable synchronously regardless of the actuation of the X actuation element or X actuation element, the Y actuation element or Y actuation element, the Z fine displacement control or the Z fine displacement control.” Thus, Appellant’s on/off switch when turned on moves the stage independently from the settings at the X, Y and Z actuation elements, and moves both stages synchronously.

Similarly, Garner teaches a fine control switch (i.e., switch 40) used to toggle between a number of pre-selected stage movement speed ranges in the X and Y directions, and, thus, vary the entries at the X and Y control knobs (14, 16, 18) (Finding of Fact 11). Thus, Garner’s on/off fine control switch 40 (note that a switch is necessarily an on/off switch) when turned on to a pre-selected stage movement speed range moves the stage independently from the settings at the X, Y, and Z actuation elements or control knobs (14, 16, 18). Note that Garner’s switch 40 will be independent of the Z entry and thus will act “regardless of the actuation . . . the Z fine displacement control” as claimed in claims 10 and 16. As stated previously, the synchronous movement of the two mask locations (i.e., 20 and 21 as taught by Uchiyama), move synchronously with the movement of table 22. Therefore, Uchiyama in combination with Garner would provide for the synchronous movement of the locations/masks (i.e., 20 and 21) in the X and Y directions according to the chosen pre-selected stage movement independent from the entries at the X, Y, and Z actuation elements or control knobs (14, 16, 18).

Thus, we are not persuaded by Appellant’s argument regarding claims 10 and 16, because Uchiyama in view of Garner teach an on/off switch for the

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synchronous displacement of the two motorized XYZ stages (i.e., 20 and 21).

CONCLUSIONS OF LAW

We conclude that the Appellant has not shown that the Examiner erred in rejecting claims 1-20 under 35 U.S.C. § 103(a).

DECISION

The decision of the Examiner to reject claims 1-20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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